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ABSTRACT

In this study of early peer interaction, 32 first born infants (16 boys, 16 girls) were videotaped in pairs at 6, 9 and 12 months. Each 15 minute session consisted of Toys Present (TP) and Toys Absent(TA) conditions counterbalanced across dyads. Three questions were addressed: (1) Are infants as young as 6 months capable of interacting with a peer? (2) What type of social acts are used during these early encounters? (3) Do toys facilitate the interactions? Successful attempts to interact occurred about 38% of the time. Interactions of the form "social behavior/social response" were the most common exchange even at 6 months, although less social contingencies were also common. Within the sequences, vocalizations, smiles and touches were the most frequent social acts used to initiate, maintain and terminate the interactions. Toys were found to have a significant effect on the interactions. More and longer sequences occurred in the absence of toys, and every social act with the exception of object related social acts was more frequent in the TA condition. There were indications, however, that the objects became more important towards the end of the first year.
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Infant-Peer Sociability: Its Structure, Content and Situational Variability

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Abstract

Thirty-two first born infants (16 boys, 16 girls) were videotaped in pairs at 6, 9, and 12 months. Each 15 minute session consisted of Toys Present (TP) and Toys Absent (TA) conditions which were counterbalanced across dyads. Three questions were addressed: (1) Are infants as young as 6 months capable of interacting with a peer? (2) What type of social acts are used during these early encounters? (3) Do toys facilitate the interactions? Successful attempts to interact occurred about 38% of the time. Interactions of the form "social behavior/social response" were the most common exchange even at 6 months, although less social contingencies were also common. Within the sequences, vocalizations, smiles, and touches were the most frequent social acts used to initiate, maintain, and terminate the interactions. Toys were found to have a significant effect on the interactions. More and longer sequences occurred in the absence of toys, and every social act with the exception of object related social acts was more frequent in the TA condition. There were indications, however, that the objects became more important towards the end of the first year.

Infant-Peer Sociability: Its Structure, Content, and Situational Variability

A number of recent studies (Bronson, 1975; Eckerman, Whatley & Kutz, 1975; Mueller & Brenner, 1977; Ross & Goldman, 1976) have examined peer interaction in the second year of life. These studies have shown that toddler-peer interaction exists (e.g., Bronson, 1975; Lewis, Young, Brooks & Michalson, 1975), outlined the structural and developmental features of the toddlers' interactions (Mueller & Lucas, 1975; Ross & Goldman, 1976), and begun an inquiry into the origins of the peer interaction system (Eckerman & Whatley, 1977; Mueller & Brenner, 1977; Vandell, 1977).

The present study may be seen as a continuation of these research traditions, but with a notable exception. Unlike most recent studies which have examined toddlers, the children observed in the present study were 6-months-old at the first observation. This examination of younger infants was undertaken for several reasons. First, it is reasonably clear that even at 12 months peer social interactions are present (Eckerman, Whatley, & Kutz, 1975; Ross & Goldman, 1976). Thus, if one is interested in examining the earliest instances of peer interaction, one must turn to children younger than 12 months. Six-month-olds were examined because Becker's recent work (1977) documented the presence of interaction in 9-month-olds. The first question addressed in the current study was then "are interactions apparent in the peer encounters of 6-month-olds?".

In examining this question, issues concerning the structure of early exchanges must be raised. Mueller and Vandell (1979) have described the predominant form of toddler-toddler interaction as being "the social behavior of one child being responded to by a second child's social behavior."

This interaction structure was seen as similar to that of conversations between adults. At the same time, Mueller and Vandell suggested that other types of contingencies might characterize younger infants. For example, younger infants might first establish fortuitous or accidental sequences. Thus, one infant might push a bell on a toy and the second infant might reach for the toy. If the babies focused on the toy and never looked at one another, it may be assuming too much to say that the infants were socially interacting even if the contingencies approximated social turn taking. Still, these fortuitous exchanges may ultimately lead to social interaction. Mueller and Vandell, for example, have suggested that numerous "accidental" impingings may force infants to accommodate one another in social interaction. The current study proposed to address these possibilities.

A second set of questions was also examined. The toddler work has indicated the predominantly prosocial nature of toddler-toddler interaction. As a rule, prosocial acts have been found to be much more common than agonistic acts (Eckerman, Whatley & Kurtz, 1975; Vincze, 1972). At the same time, toddlers' interactions with peers seem to be predominantly motoric (Mueller & Brenner, 1977; Vandell, 1977). One may ask whether infant-peer interactions are also characterized by prosocial motoric acts. It may be that infants with their less developed motor skills differ from toddlers in the content and tone of their peer interactions.

One final issue was explored in the current study. The primary role of objects in the development of toddler social interaction has been hypothesized (Eckerman, Whatley, & Kutz, 1975; Mueller, in press; Mueller & Brenner, 1977). Investigators (Mueller & DeStefano, Note 1) have argued that objects may "invite" and "demand" the development of interaction in toddlers. The interactions are "demanded" when one child's action (like taking a toy) forces

the other child to act. The interactions are "invited" when the objects provide the toddlers with the opportunity to realize the possibility of mutually controlling one another.

At the same time, not all objects are equal facilitators of toddler-toddler interaction (DeStefano, 1976; Eckerman & Whatley, 1978). The presence of numerous small toys seems to depress the likelihood or social interaction since the toddlers tend to focus on the toys and ignore one another. Large toys, in contrast, appear to foster interaction. When the toys are large enough for two children to share, the probability of the toddlers recognizing their mutual contingencies is enhanced. A paradoxical relationship emerges in the absence of toys. The children frequently turn to one another in interaction, but they also cry more. To date, this examination of the role of objects in interaction has been restricted to toddlers, since Bühler (1927) suggested their importance over fifty years ago. Given the relative lack of skills with objects in six month olds, however, it may be that objects function differently in the first and second year.

In sum, this study was a descriptive yet systematic examination of the nature of infant-peer relations. Specifically, the organizational features and content of the infant interactions were examined as was the role of toys in the interaction. The study may also be seen as an extension of the methods and concepts developed within the toddler-peer area.

Method

Subjects

Thirty-two first born infants (16 male, 16 female) were observed at 6½ (±15 days), 9½ (±15 days), and 12½ (±10 days) months. The infants were paired to form 8 girl dyads and 8 boy dyads. The same, same-sexed

pairs were maintained through all observations. All the infants whose names were obtained from local physicians were from white, middle-class families. No financial remuneration was provided. Questionnaires assessing the amount of experience with peers indicated that 37.0% of the 6-month-olds, 48.2% of the 9-month-olds, and 73.3% of the 12-month-olds were with a peer at least once a week. There were no significant differences in the amount of peer experience for boys and girls.

Procedure

Each child was observed a total of nine times (3 times at 6, 9, and 12 months). The same observation schedule was followed for each dyad at all 3 time periods. Visit 1 consisted of a 15 minute peer session. Visits 2 and 3 consisted of 15 minute peer sessions followed by 15 minute mother-infant sessions (one mother-infant observation each visit). The present study describes the results from Visit 1 at 6, 9, and 12 months. Results from the other peer visits and the mother-infant sessions will be reported at a later date.

Each peer session was conducted in a carpeted playroom which had one-way glass across the upper half of two opposite walls. Brightly colored pictures were on the lower part of the walls and pillows were along one wall. Two videocameras with zoom lens were placed behind the two walls of one-way glass. The cameras were positioned in such a way that at least one camera was usually able to record the infants' faces. A special effects generator (SEG) enabled the picture from both cameras to be recorded on a split screen mixture. The SEG operator communicated with the camera operators via microphone and ear phones to insure the best picture of both infants.

Each peer session was 15 minutes in duration and was divided into two parts: Toys Present (TP) which lasted 10 minutes and Toys Absent (TA) which lasted for 5 minutes. These two procedures were counterbalanced across the dyads such that half of the boys and girls had TP first. The 10/5 designation was derived during pilot testing. Because many of the infants became distressed after 5 minutes without toys, the TA condition was limited. Comparisons of the first and second 5 minutes of the TP condition revealed no differences for any measure.

The same instructions were followed in both conditions. The mothers were asked to place their babies in the center of the room so that the babies were about 12" apart. The mothers were then instructed to make themselves comfortable on the pillows along the wall. They were told to feel free to talk with one another, but not to initiate interactions with their babies. They were asked to intervene only if they felt their babies needed to be comforted or if they feared their babies would be injured. During TP a group of toys (4 cloth books, 6 small blocks, rattle, 10" butterfly ball, pop beads made into 18" ring, plastic key ring, play telephone, large play box with lid) was arranged in a systematic order.

Coding Procedure

The videotapes were transcribed using a longhand description which included the pattern of actor changes in the sequences, the identification of the actors within the sequences, the beginning and ending times for the sequences, and a designation of the complexity of the social behaviors.

Within the sequences a distinction was made whether an act was social. Corresponding to a definition developed by Mueller (Mueller & Brenner, 1977), a socially directed behavior (SDB) was any act accompanied by a

look to the head of the peer. Two levels of complexity of SDBs were recorded. A simple SDB was a single act (like a smile) in conjunction with visual regard, while a coordinated SDB consisted of two or more simultaneous or contiguous acts (like a smile and vocal).

Five types of sequences of behavior were seen as possible. The most social sequences (called social interactions) were those exchanges in which Child A and B both used SDBs. For example, if Child A vocalized to Child B and Child B responded by vocalizing to Child A, this sequences was coded as "Child A SDB / Child B SDB." The least social sequence was that situation in which one child did some behavior (e.g., pulled a toy) which then elicited a response from the second child (e.g., B reaches for the moving toy). In this sequence which was coded "Child A BEH / Child B ER", there was no clear evidence of social intent by either partner, but the coders were still certain that B's act was in response to A's act. Two more intermediate sequences were also seen as possible. In these sequences, one infant directed a social behavior to the other child. Thus, Child A might offer a toy to Child B who might then touch the toy without ever looking at Child A. This sequence would be coded "Child A SDB / Child B ER." Or, it was possible for A to do a non-social behavior (e.g., bang on the wall) which then elicited a social response from B (e.g., looks at A and vocalizes). This sequence would be recorded as "Child A BEH / Child B SDB." The fifth sequence type was designated as "mixed" and included all sequences in which SDBs, BEHs, and ERs were interspersed. The sequence "A BEH / B SDB / A SDB / B ER" is a mixed sequence.

At the same time, some SDBs did not receive either a social (SDB) or non-social (ER) response. These SDBs were included in the longhand record

along with their starting and stopping times. These isolated SDBs were seen as instances of unsuccessful attempts to interact.

From the written record, a number of measures were extracted: the frequency of each sequence type, the amount of time spent in each sequence, the lengths of the sequences in terms of the number of actor changes, the frequency of isolated SDBs and the relative frequency of simple and coordinated SDBs.

The videotapes were then replayed to determine the content of each SDB. The behaviors were identified according to nine categories: Vocal -- any sound except cry, cough, sneeze; Agonistic -- hit,push; Gesture -- e.g., point; Cry -- includes frets; Touch -- e.g., pat; Smile; Object Related Social Act -- e.g., offer, show, take; Large Body -- e.g., flap arms, clap; and Approach -- come within 2 ft. A single coordinated SDB might include several of these categories.

Inter-Observer Reliability

The videotapes were coded by two skilled coders who first recorded the longhand sequence and then the content categories of the social behaviors. Five videotapes were then randomly selected and independently coded by a third coder. Reliability for the content categories for each videotape was computed using the formula, "Agreement / Agreement + Disagreement." Reliability for the frequency and duration measures of the sequences was computed using an ANOVA for the reliability of judges (Winer, 1971, pp. 283-296). For every measure, reliability exceeded .80.

Results

Several questions are examined in the data analyses: (1) Did the infants interact, and if so, what was the form of these interactions? (2)

What social messages were conveyed during the encounters; i.e., what type social acts were used by the infants? (3) What role did toys play in the early interactions? Were the interactions facilitated or hindered by the presence of toys?

In addressing these questions, analyses combining the data for 6, 9, and 12 month olds are presented first in the text. These summary data are used because very few age changes were found. Table 1, however, presents the sequence data by age.

Description of Early Interactions and Sequences

As shown in Table 1, the most common sequence type at all three ages (overall M = 4.4) was of the form "SDB / SDB." Thus, the infants most often engaged in sequences in which both participants acted socially. Least common were the "BEH / ER" (M = .7) and "SDB / ER" (overall M = .7) sequences. Thus, it appears that elicited non-social responses were rare. The "BEH / SDB" (overall M = 1.8) and the "mixed" sequences (overall M = 1.5) were in an intermediate position. In all, over the 6 month period, the infants averaged about 9.87 sequences per 15 minutes with about half being "true" interactions.

Insert Table 1 about here

During this period, the majority of the sequences (M = 60.1%) were short, two-unit exchanges (A acts / B acts). Three unit exchanges (A acts / B acts / A acts) made up only about 25% of the sequences. Four unit or greater exchanges were uncommon, only about 15% of the sequences. In terms of time, the infants averaged about 46.3 seconds in some type of sequence with about 27.3 seconds being spent in social interactions (SDB/SDB).

In addition to examining the sequences of behavior, isolated SDBs (those social behaviors which failed to elicit a response) were recorded. On the average, 7.7 isolated SDBs occurred per infant in a 15 minute session. At the same time each infant successfully initiated about 4.6 sequences. Thus, the infants were successful at initiating interactions about 37.4% of the time.

The complexity of the social behaviors (i.e., whether the SDBs were simple or coordinated) was also examined. The behaviors were about evenly distributed between the two types, with about 47% of the SDBs being coordinated. Thus it appears that even in the first year infants were not only able to combine social acts into more complex patterns but that they did so about half of the time.

Content of the Infant Social Acts with Peers

The examination of the content of the social behaviors to peers indicated the strongly prosocial and vocal nature of the early peer interactions. By far the most common acts were vocalizations ($\underline{M}$ = 9.79). Smiles and touches ($\underline{M}$ = 3.85 and $\underline{M}$ = 3.00, respectively) were the next most common acts. Other acts in order of frequency over the 15 minute period were large body acts ($\underline{M}$ = 2.19), object related social acts ($\underline{M}$ = 1.34), gestures ($\underline{M}$ = 1.27), cries ($\underline{M}$ = 1.26), approaches ($\underline{M}$ = .90), and agonistic acts ($\underline{M}$ = .31).

The frequency of object related social acts is fairly surprising considering that for five minutes of the observation no toys were present. When the frequency of object related social acts in the presence of toys was contrasted to the other social acts during the TP condition, the object

related social acts were the third most common act, following vocalizations and smiles.

As part of the examination of the content of these early social acts, the likelihood of particular social acts serving different roles in the initiation, maintenance, and termination of the sequences was explored. (An initiation was defined as the first behavior in a sequence. The termination was the last behavior in the sequence. Maintenance behaviors were all acts between the initiation and the termination.) In the first analyses, the probability of each social act initiating, maintaining, and terminating a sequence was calculated relative to the total number of cases in that role. For example, the proportion of vocal initiations was calculated relative to the total number of initiating acts. When these proportions were ranked in correlation analyses, it was apparent that the proportional use of social acts in the three roles was very similar, $r\ (30) = .932$, $r\ (30) = .937$, and $r\ (30) = .967$ for initiation and maintenance, initiation and termination, and maintenance and termination, respectively. Those acts which were most frequent overall were also the most common in all three interaction roles. Thus, vocalizations and smiles frequently initiated, maintained,and terminated interactions. Agonistic acts and approaches (which were infrequent overall) were unlikely initiators, terminators, and maintainors.

Because the first analysis was strongly dependent on the overall frequency of acts, a second analysis of interaction roles was completed. This analysis considered the distribution of roles within each social act. Thus, if an act occurred four times (2 times as an initiation, once as a termination and a maintenance), a .5 was recorded for initiation, .25 for

termination and .25 for maintenance. Using this method, it was apparent that some of the less common social acts (in terms of overall frequency) were used differentially within the sequences (see Table 2). For example,

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Insert Table 2 about here

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agonistic acts and approaches were relatively more likely to initiate interactions, while touches and gestures were more likely to terminate the interactions. Likewise, some acts were unlikely in some interaction roles. Gestures were unlikely initiators. Cries and touches were inrrequent maintainors. Approaches and agonistic acts were infrequent terminators. At the same time, some of the more common acts (e.g., object related acts and smiles) were evenly distributed in the three roles.

Factors Affecting Infant-Infant Interaction

The design of the current study was such that possible toy effects, sex differences,and age differences in infant-peer interaction could be explored. These factors were explored in three-way analyses in which sex was a between factor and toy condition and age were within factors. Because of the unequal durations of the TP and TA conditions, the TA scores were doubled to equal a ten minute obeervation. (While this procedure statistically equated the sessions, it may not indicate what would have occurred if the session continued that long.) Because of the small frequencies of some measures, individual frequency scores were transformed using the square root transformation. The percentage scores were transformed using the arc sin transformation.

With the number of dependent variables being considered, multifactor MANOVAs were computed first. The MANOVAs were computed for three clusters of variables: (1) Sequence Measures -- which included frequency of interactions, frequency of sequences excluding interactions, duration of interactions, duration of sequences excluding interactions, and proportion of two-unit exchanges; (2) Content Measures -- which included the frequencies of vocalizations, cries, agonistic acts, object related social acts, large body acts, gestures, touches, smiles, and approaches; and (3) Individual Sociability Measures -- which included the frequencies of initiations, terminations, simple SDBs, coordinated SDBs, isolated SDBs, and the percentage of coordinated SDBs.

No significant sex differences were found in the multivariate analyses. The MANOVAs did indicate a significant object effect, however, for the Sequence Measures, Content Measures, and Individual Sociability Measures, $F(4, 25) = 10.45$, $p < .001$, and $F(9, 52) = 10.38$, $p < .001$, and $F(8, 53) = 10.53$, $p < .001$, respectively. A significant age effect was found for Content Measures, $F(18, 104) = 3.56$, $p < .01$.

Univariate ANOVAs indicated that the effects of the toy condition were pervasive (see Table 3). Interaction frequencies and durations as well as

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Insert Table 3 about here

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sequence durations were greater in the absence of toys. The proportion of exchanges greater than two units was also greater in the absence of toys. In terms of Individual Sociability, the frequencies of simple SDBs, coordinated SDBs, and isolated SDBs were all greater in the TA condition.

Finally, every content act with the exception of object related social acts was more common in the absence of toys. Thus, there were more smiles, vocalizations, touches, and gestures as well as more peer directed cries and agonistic acts when the toys were removed.

Univariate ANOVAs indicated three significant age effects. The frequency of social approaches (6 months $\underline{M}$ = .19, 9 months $\underline{M}$ = .68, 12 months $\underline{M}$ = 1.82), object related social acts (6 months $\underline{M}$ = .61, 9 months $\underline{M}$ = .96, 12 months $\underline{M}$ = 2.44) and percentage of coordinated SDBs (6 months $\underline{M}$ = 43.3, 9 months $\underline{M}$ = 45.5, 12 months $\underline{M}$ = 51.4) increased with age, $F(2, 60) = 12.10$, $p < .001$, and $F(2, 60) = 7.81$, $p < .001$, and $F(2, 60) = 4.41$, $p < .02$, respectively.

Discussion

The first question addressed in the current study was whether infants were capable of engaging in peer interactions. The reply to this question must be an affirmative. It was apparent, even at six months, that infants established patterns of contingent responses, and almost half of these exchanges were social interactions. When one considers that these interactions required one child to direct a social behavior to a second child who then responded socially, the amount of social skill and awareness was remarkable. Many of the more fortuitous sequences also revealed considerable social awareness. Those purely nonsocial sequences in which neither partner seemed aware of the other were rare. More common were those cases in which the second child responded socially to the first child's nonsocial act or those cases in which social and nonsocial elements were mixed.

The level of social skill was also impressive in terms of the complexity of the social behaviors used. About half of the time, the infants were combining social acts in their attempts to interact. If one adopts a Piagetian orientation that the ability to coordinate actions is an indication of greater skill, then the infants were showing a considerable level of social skill.

At the same time, one should not overestimate the infants' social skills. The majority of the exchanges were brief, two unit exchanges in which one child acted and the second child responded. In contrast, Mueller and Brenner (1977) have reported more longer exchanges between familiar toddlers. The infants' success at initiating exchanges was also less than that reported for toddlers (Vandell, 1977). Finally, while half of the contingencies were social interactions (SDB / SDB), this proportion was less than that suggested for toddlers (DeStefano, 1976; Mueller & Vandell, 1979). The fortuitous sequences seem more common in infants than in toddlers.

Further research is necessary to determine the role of these less social sequences in the development of early peer social interaction. On the one hand, the apparent difference in the number of fortuitous sequences in toddlers and infants supports the hypothesis that social interaction grows out of the nonsocial sequences. At the same time, between the 6 month and 12 month observations, there was no evidence of the nonsocial sequences declining and being replaced by social interaction sequences. Such a shift would appear necessary if fortuitous sequences are precursors to interactions. With these discrepancies, additional research is needed. It would be helpful, for example, for a future study to examine infant "friends." Perhaps a shift from nonsocial to social sequences requires extensive experience with a familiar peer.

The present study also illustrates the need for further work on the role of objects in early interaction. While the current findings are very similar to Eckerman and Whatley's (1975) results with toddlers, it may be premature to conclude that (a) objects unilaterally discourage early peer interaction and (b) objects operate similarly for infants and toddlers. The infants' TA condition had to be terminated earlier than the TP condition because the infants became so distressed. In contrast, many infants could have continued the TP condition indefinitely. Thus, it may be that the TA condition represents a special situation which momentarily enhances sociability but lacks ecological validity. Perhaps it is in the longer TP encounters that more sophisticated interactions ultimately emerge.

It may also be premature to assume that objects function similarly in the infants' and toddlers' interactions. Object related social acts were one of the few acts that increased systematically for the infants over time. The 12-month-olds were much more likely to incorporate objects in their social acts than were the 6-month-olds. Furthermore, the increase in coordinated social behaviors indicated that the infants were better able to incorporate objects in their social répertoire as they approached the second year. These data suggest that the extensive use of objects in social interaction may require cognitive skills that the 6-month-olds lack.

One final issue should be mentioned. With few exceptions (the increases in object related social acts, approaches, and percentage of coordinated SDBs) no significant age changes were found. This lack of change seems to be in opposition to the cognitive and motor development usually associated with infancy. The lack of change is also contrary to what might be expected in

light of the infants' increased peer exposure over time. Why then were there no changes in the number of interactions, the duration of the interactions, or the frequency of most of the social acts? It may be that the level of peer social skills is fairly stable across the first year and that growth appears only when the first and second years are contrasted. However, it may also be that the appearance of growth in social skills requires the presence of familiar peers. Mueller and Vandell (1979) have noted that peer familiarity exerts a major impact on the apparent growth of toddlers' peer skills. Finally, the lack of growth may reflect a general lack of peer experience. Although many of the infants were with a peer once a week, this amount of experience may be inadequate for the development of early interaction skills. Subsequent research is needed to address the possibilities.

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Table 1

Mean Frequencies and Durations of Interactions and Sequence by Age

	6 months	9 months	12 months
Frequency of			
BEH/ER sequence	.7	.4	1.1
BEH/SDB sequence	1.9	1.6	2.0
SDB/ER sequence	.5	1.0	.6
SDB/SDB interaction	4.3	4.9	4.1
MIXED sequence	.9	2.4	1.2
Isolated SDB	7.2	7.0	8.8
Duration (in sec.) of			
Sequences[1]	38.8	56.8	43.5
Interactions	26.2	31.6	24.1

[1]includes interactions

Table 2

Percentage and Rank of Each Social Act as

An Initiator, Maintainer, and Terminator

Social Act	Initiation		Maintenance		Termination	
	%	Rank	%	Rank	%	Rank
Agonistic	57.8	(1)	20.6	(7)	21.6	(8)
Approach	47.0	(2)	35.6	(1)	17.3	(9)
Cry	43.3	(4)	16.9	(9)	39.8	(3)
Gesture	29.5	(9)	24.0	(3)	46.1	(1)
Object related	42.9	(5)	22.6	(4)	35.2	(5)
Smile	41.7	(6)	21.0	(5)	37.9	(4)
Large Body	38.9	(7)	28.1	(2)	34.1	(6)
Touch	36.9	(8)	18.8	(8)	44.0	(2)
Vocal	45.4	(3)	20.8	(6)	33.0	(7)

Table 3

Mean Frequencies and Duration in the

Presence and Absence of Toys

	Toys Present M	Toys Absent M	Significance Level
Interaction Duration	11.20	32.17	.01
Sequence Duration	10.27	17.47	.10
Proportion of 3-unit plus exchanges	30	46	.05
Sequences (excluding interactions)[1]	3.27	3.03	
Interactions	2.17	4.52	.01
Isolated SDBs	4.40	6.58	.001
Simple SDBs	4.13	5.97	.10
Coordinated SDBs	2.96	7.27	.001
Vocal acts	5.35	8.89	.01
Agonistic acts	.12	.38	.10
Cries	.49	1.2	.05
Gestures	.53	1.46	.001
Touches	.69	4.62	.001
Smiles	1.62	4.46	.001
Object related acts	1.22	.22	.001
Large body acts	1.14	2.09	.05
Approaches	.33	1.13	.001

[1]Values represent frequencies unless otherwise noted